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servations being telegraphed to other river stations and to Washington. Since that time each issue of the *Monthly Weather Review* has contained a summary of the water fluctuations and floods of the principal waterways of the country. The work has been very greatly extended during the last few years, and on January 1, 1896, the stations operated in connection with it were as follows: 135 special river stations equipped with standard river gauges; 44 rainfall stations, so distributed in the various catchment basins as to give, in connection with the regular stations of the Bureau, a fair approximation of the average rainfall over each watershed; 38 completely equipped meteorological stations where river measurements were made, and 22 Weather Bureau stations which were centers from which flood warnings and forecasts of expected changes in river level were issued. Since July 1, 1893, the immediate supervision of the river service and the predicting of river changes for their several districts has been delegated to the various local forecast officials. The importance of the flood forecasts can hardly be calculated, but as one example we note that the warnings of a flood on May 21 and 22, 1894, at Harrisburg, Pa., saved property and live stock of an estimated value of \$60,000 to \$70,000.

WINDS OF THE SOUTH ATLANTIC OFF THE COAST OF BRAZIL.

THE August *Pilot Chart of the North Atlantic Ocean* makes clear the January and July wind relations of the South Atlantic Ocean adjacent to the coast of Brazil, by means of two small charts and some explanatory text. The charts are compiled from returns made by volunteer observers of the Hydrographic Office during 1890-95, and show by wind-roses the percentages of the winds that may be expected from the different directions, and the chances of finding calms. The effects of the seasonal

changes of pressure over South America are clearly seen. In July (winter) the S. E. Trades are carried southward to the 20th parallel, while in January (summer), owing to the presence of the continental area of low pressure over South America, the S. E. Trades are replaced north of Cape San Roque by N. and N. E. winds, these being the in-draft on the eastern side of the low pressure area.

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PSYCHOLOGICAL NOTES.

WITH the exception of the advancement of scientific research there is no subject more important to men of science than the adequate teaching of the sciences in our colleges and schools. The efforts now being made by the Natural Science Department of the National Educational Association to properly coordinate higher and secondary scientific education should be heartily supported, and those who have read in this JOURNAL the addresses by Profs. Bessey, Carhart, Freer, Jordan and Gage, at the recent meeting of the N. E. A., will understand what excellent leadership controls the movement. As a psychologist, interested in the development of the child, its senses and movements, I wish to urge that scientific education begin with the kindergarten. There are but few things more pathetic than the ignorant zeal of the average kindergarten teacher. I have recently examined the catalogue of kindergarten supplies offered by the Milton Bradley Co., and find it simply abominable. Nearly everything seems especially devised to injure the eyesight and the nervous system of the child. The young child should be taught to concentrate the attention, to observe accurately and to make easily movements not requiring nice adjustments. The best thing he can do is to learn to classify things by their resemblances, to watch plants grow, to take

care of animals, to learn the geography of the schoolhouse, to use tools, to weigh and measure on a large scale. These are the beginnings of science and are the best subjects for the kindergarten.

WE begin to ruin the eyesight of children in the kindergarten and continue to persecute them until the end of the college course. Some time since I wished to find an edition of *Homer* for my own use, and after examining about twenty editions could not find one that I regarded as properly printed. If children are legally forced to attend the public schools, and their eyesight is injured by long sessions, badly printed books and badly lighted and ventilated rooms, could they not bring suit for damages against the State or district that has forcibly injured them? My own progressive myopia and accompanying headaches were caused by private schools, and I have no redress; but if some public spirited man of science would bring suit against the proper body, the result, whether damages were allowed or not, would be most useful.

WHAT we need is a scientific study of the conditions of fatigue in reading, and a step in this direction is made by a research from the psychological laboratory of Columbia University by Dr. Griffing and Mr. Franz, to be published in the September number of *The Psychological Review*. Starting from a research of my own (*cf.* SCIENCE, O. S., Vol. VII., p. 128), on the legibility of the letters used in printing, the authors investigate the size and style of type, the color and quality of paper and the illumination. Type should not be less than 1.5 mm. in height; it should be leaded, and the illumination of the printed page should not be less than 100 candle-meters. Yet most school books are printed in small type, without leads, on poor or glazed paper, and the illumination in many school rooms is less than 2 candle-meters. I found the relative legibility of

the small letters to be in the following order: d k m q h b p w u l j t v z r o f n a x y e i g c s. Thus some of the letters most frequently used are among the most illegible. The letters used in printing were developed from those used in writing, and these were evolved in accordance with the convenience of the writer, not for the advantage of the reader. Now that we write chiefly with the printing press, it is absurd to retain symbols whose legibility would be greatly improved by a slight modification.

It is often said that psychology has no practical applications, but another article will be found in the September number of *The Psychological Review* of general interest. Prof. Patrick and Dr. Gilbert, of the University of Iowa, have kept three observers awake during ninety consecutive hours. The anti-vivisection societies might expect to find enlarged usefulness in the psychological laboratory, but it happened that the observers suffered in no wise from the 'fast,' although dogs die if kept awake four or five days. Careful records were taken of the physical and mental condition of the observers during and after the enforced insomnia, and the results are of the greatest interest, scientifically and practically.

DR. J. PAUL GOODE and Mr. Oliver C. Farrington have done well to call attention (SCIENCE, Vol. IV., p. 115 and p. 271) to absurdities in the illustrations of school books. I must, however, take exception to the view that mountains should be reproduced as they would be represented in a geometrical drawing or in a photograph. Mountains look higher than the angles they subtend, and should be represented as they look. Colors in a landscape are not what each would be apart from the rest. The Greeks knew very well that architecture should be psychological, not geometrical, and now that there is a science of psychology, architects and artists should study

it. It is often said that since we have instantaneous photographs of animals in movement, these should be reproduced by the artist. But this is incorrect; art is concerned not with physics but with psychology.

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SCIENTIFIC NOTES AND NEWS.

THE AMERICAN ASSOCIATION AND 'SCIENCE.'

THIS JOURNAL was established in 1883 by Mr. A. Graham Bell, who, in conjunction with Mr. Gardiner G. Hubbard, spent more than \$80,000 in its support. The loss was so large and continuous that the generous donors were compelled to withdraw their aid, and publication was suspended early in 1894. At the Brooklyn meeting of the American Association for the Advancement of Science, in August, 1894, it was thought that the continuation of such a journal was so important for the advancement of science in America and for the welfare of the Association that an arrangement for cooperation between SCIENCE and the Association was effected and unanimously adopted in the general session of the Association. The JOURNAL agreed to publish part of the papers read before the Association, and the Association appropriated on certain conditions \$750 annually toward the support of the JOURNAL. In view of the moral and financial support of the Association, and by securing an editorial committee and a responsible editor who would serve without compensation, the JOURNAL was reorganized and the publication of a new series was begun in January, 1895.

The JOURNAL has had the generous support of the leading men of science in America. The general character of its contents may be judged from the following presidential addresses which it has been able to publish since the first of January of the present year:

President Morley, before the American Association for the Advancement of Science.

President Cope, before the Society of American Naturalists.

President Shaler, before the Geological Society of America.

President Dwight, before the Association of American Anatomists.

President Hill, before the American Mathematical Society.

President Gilbert, before the Geological Society of Washington.

President Dall, before the Philosophical Society of Washington.

President Rees, before the New York Academy of Sciences.

President James, before the Society for Psychical Research.

President Bowditch, before the Massachusetts State Medical Society.

President Bessey, before the Natural Science Department of the National Educational Association.

President Merriman, before the Society for the Promotion of Engineering Education.

President Trelease, before the Botanical Society of America (in press).

At the Springfield meeting of the Association the subsidy mentioned above was paid to SCIENCE, and the money has been spent in its enlargement. Unfortunately recent meetings of the Association have been small, and it was necessary to take the money from the invested funds of the Association. The meeting at Buffalo last week was even smaller than that at Springfield, and it was believed by friends of the JOURNAL and of the Association that it would be undesirable to use further for any purpose, however important, the invested funds of the Association. But it was hoped that enough members of the Association would subscribe to the JOURNAL to make up the amount of the subsidy promised at Brooklyn.

We have not hitherto mentioned the business affairs of the JOURNAL in its pages, but the editorial importance of its continued efficiency makes it desirable to do so on this occasion. SCIENCE will not be abandoned, even though its continuation may entail serious financial sacri-